

UPS 1000 - 2200 VA User's Manual

Powerware 5125 User's Manual 1000–2200 VA

1019297

Revision A

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Requesting a Declaration of Conformity

Units that are labeled with a CE mark comply with the following harmonized standards and EU directives:

- Harmonized Standards: EN 50091-1-1 and EN 50091-2; IEC 950 Second Edition, Amendments A1, A2, A3, and A4
- EU Directives: 73/23/EEC, Council Directive on equipment designed for use within certain voltage limits
93/68/EEC, Amending Directive 73/23/EEC
89/336/EEC, Council Directive relating to electromagnetic compatibility
92/31/EEC, Amending Directive 89/336/EEC relating to EMC

The EC Declaration of Conformity is available upon request for products with a CE mark. For copies of the EC Declaration of Conformity, contact:

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FIN-02920 Espoo, Finland
Phone: +358-9-452 661
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Class A EMC Statements (1000–1500 VA Models)

FCC Part 15

NOTE This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

ICES-003

This Class A Interference Causing Equipment meets all requirements of the Canadian Interference Causing Equipment Regulations ICES-003.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Special Symbols

The following are examples of symbols used on the UPS to alert you to important information:



RISK OF ELECTRIC SHOCK - Indicates that a risk of electric shock is present and the associated warning should be observed.



CAUTION: REFER TO OPERATOR'S MANUAL - Refer to your operator's manual for additional information, such as important operating and maintenance instructions.



RJ-45 RECEPTACLE - For 230V units only: this receptacle provides network interface connections. Do not plug telephone or telecommunications equipment into this receptacle.



This symbol indicates that you should not discard the UPS or the UPS batteries in the trash. The UPS may contain sealed, lead-acid batteries. Batteries must be recycled.

1 Powerware 5125 – Introduction

The Powerware® 5125 uninterruptible power system (UPS) protects your sensitive electronic equipment from basic power problems such as power failures, power sags, power surges, undervoltage and overvoltage.

Power outages can occur when you least expect it and power quality can be erratic. These power problems have the potential to corrupt critical data, destroy unsaved work sessions, and damage hardware — causing hours of lost productivity and expensive repairs.

With the Powerware 5125, you can safely eliminate the effects of power disturbances and guard the integrity of your equipment. The Powerware 5125 was designed for critical applications such as PCs, servers, workstations, and telecommunications equipment. Figure 1 shows the Powerware 5125 UPS with an optional Extended Battery Module (EBM).

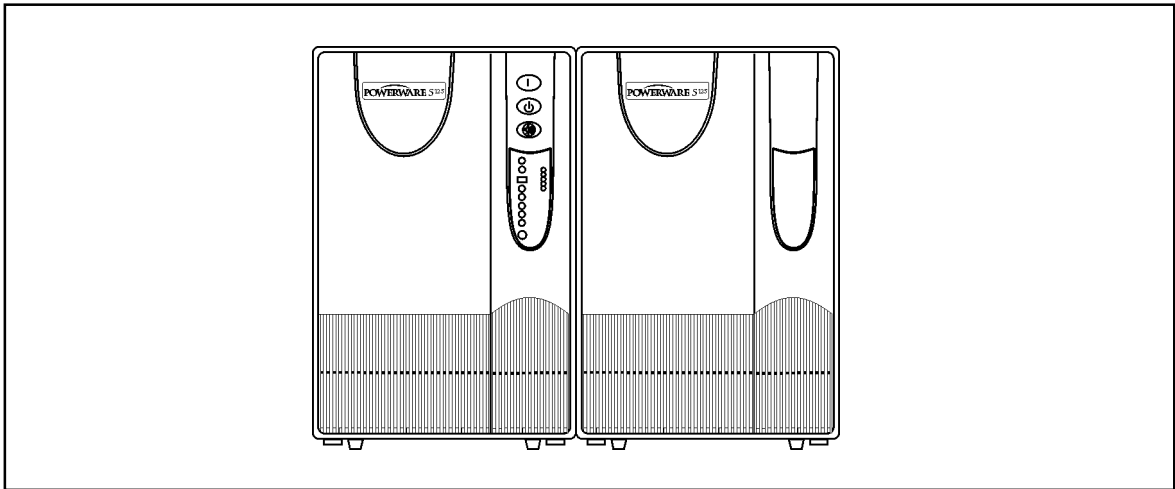


Figure 1. The Powerware 5125

Providing outstanding performance and reliability, the Powerware 5125's unique benefits include the following:

- Advanced Battery Management Plus (ABM Plus™) doubles battery service life, optimizes recharge time, and provides a warning before the end of useful battery life.
- Buck and Double Boost regulation ensures consistent voltage to your load by correcting voltage fluctuations without using battery power.
- Hours of extended run time with up to four EBMs.
- Hot-swappable batteries simplify maintenance by allowing you to replace batteries safely without powering down the critical load.
- Start-on-battery capability allows you to power up the UPS even if utility power is not available.
- Advanced power management with the Software Suite CD for graceful shutdowns and power monitoring.
- Sequential shutdown and load management through separate receptacle groups, called load segments.
- Network Transient Protector guards your network communications equipment from surges.
- Optional X-Slot™ modules provide enhanced communication capabilities for increased power protection and control.
- The Powerware 5125 is backed by worldwide agency approvals.

2 Installation

Inspecting the Equipment

If any equipment has been damaged during shipment, keep the shipping cartons and packing materials for the carrier or place of purchase and file a claim for shipping damage. If you discover damage after acceptance, file a claim for concealed damage.


To file a claim for shipping damage or concealed damage: 1) File with the carrier within 15 days of receipt of the equipment; 2) Send a copy of the damage claim within 15 days to your service representative.

Installing the UPS

The following steps explain how to install the UPS. See “UPS Rear Panels” on page 9 for the rear panel of each model.

NOTE Do not make unauthorized changes to the UPS; otherwise, damage may occur to your equipment and void your warranty.

1. If installing an optional EBM, continue to Step 2; otherwise, skip to Step 4.
2. Plug the EBM cable into the battery connector on the UPS rear panel.
3. If a second EBM is to be installed, plug the EBM cable of the second cabinet into the battery connector on the first EBM. Up to four EBMs may be connected to the UPS.
4. If you are installing power management software, connect your computer to the UPS communication port using the supplied communication cable.
5. Plug the detachable UPS power cord, into the input connector on the UPS rear panel.
6. Plug the UPS power cord into a power outlet. The front panel indicators cycle through a startup sequence while the UPS conducts a self-test.

When the self-test is complete, the  indicator flashes, indicating the UPS is in Standby mode with the equipment offline. If the alarm beeps or a UPS alarm indicator stays on, see Table 2 on page 22.

7. Plug the equipment to be protected into the appropriate UPS output receptacles (see page 15 for more information on load segments).

DO NOT protect laser printers with the UPS because of the exceptionally high power requirements of the heating elements.

8. Press and hold the On button until you hear the UPS beep (approximately one second). The indicator stops flashing and the bar graph indicators display the percentage of load being applied to the UPS.

The UPS is now in Normal mode and supplying power to your equipment.

NOTE. The batteries charge to 90% capacity in approximately 3 hours. However, it is recommended that the batteries charge for 24 hours after installation or long-term storage.

NOTE. If more than two *EBMs* are installed, an external battery charger is recommended for faster recharge times.

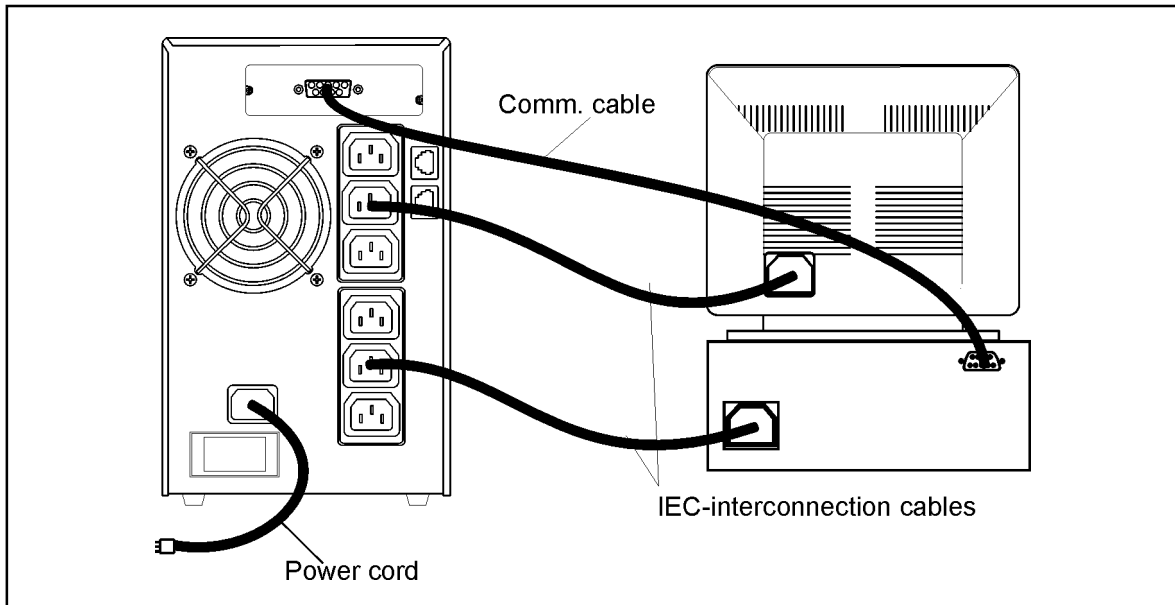


Figure 2. Installation

UPS Rear Panels

This section shows the rear panels of the Powerware 5125 models.

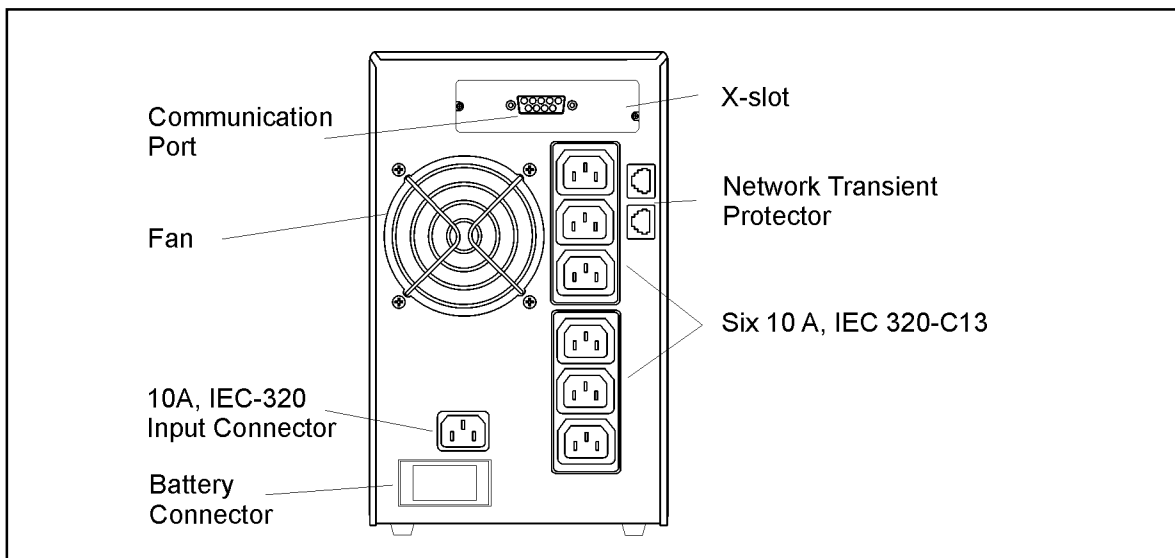


Figure 3. PW5125 1000i and PW5125 1500i Rear Panel

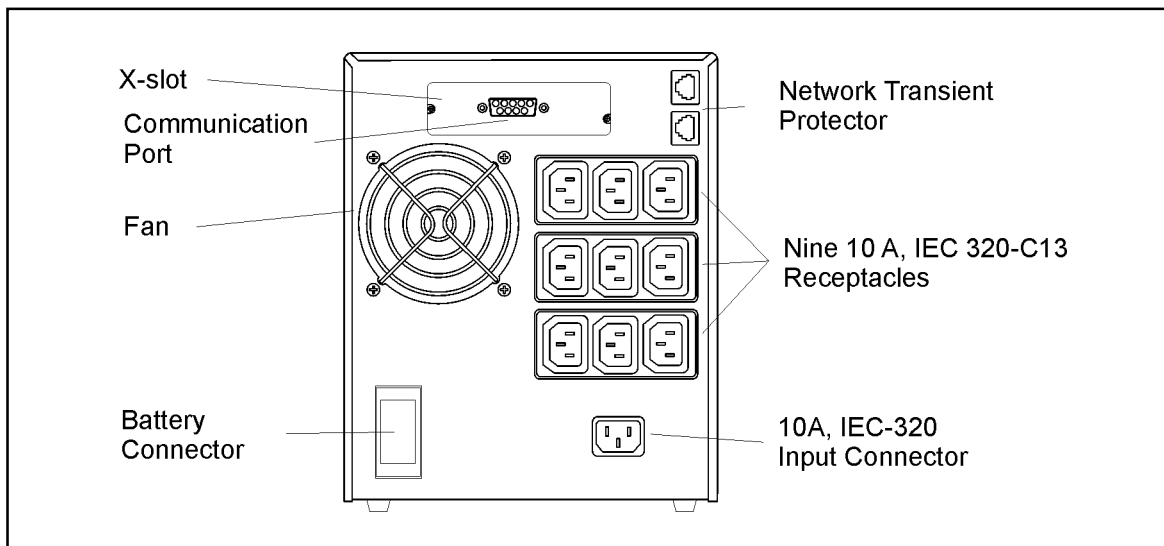


Figure 4. PW5125 2200i Rear Panel

3 Operation and Configuration

Operating Modes

Powerware 5125's front panel indicates the UPS status through the UPS indicators. Figure 5 shows the UPS front panel indicators and controls.

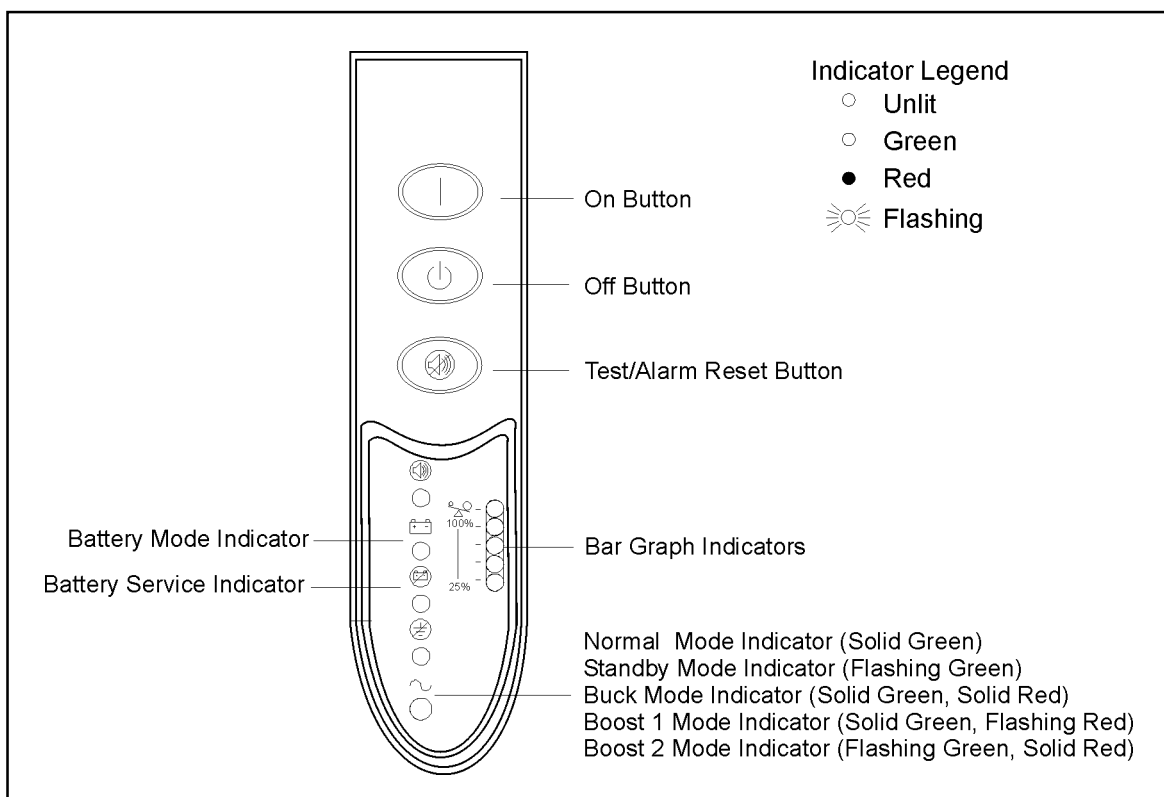


Figure 5. UPS Front Panel

Standby Mode

When the UPS is turned off and remains plugged into a power outlet, the UPS is in Standby mode. The \sim indicator flashes and the bar graph indicators are off, indicating that power is not available from the UPS output receptacles. The battery recharges when necessary.

Normal Mode

During Normal mode, the \sim indicator illuminates and the front panel displays the percentage of UPS load capacity being used by the protected equipment (see Figure 6). The UPS monitors and charges the batteries as needed and provides power protection to your equipment.

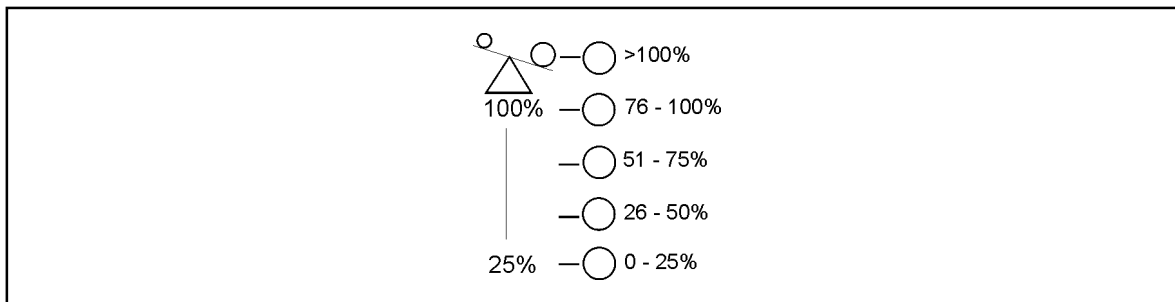


Figure 6. Load Level Indicators

When all of the bar graph indicators and the \sim indicator are illuminated, power requirements exceed UPS capacity; see page 22 for more information.

Buck and Double Boost Mode

With the Buck and Double Boost feature, the UPS accepts a wide input voltage range (-30%/+20% of nominal) and provides consistent, clean voltage to your equipment. The UPS operates normally from utility power and alerts you of the voltage fluctuations. The \sim indicator alternates between green and red while in Buck, Single Boost, or Double Boost mode as shown in Figure 7.

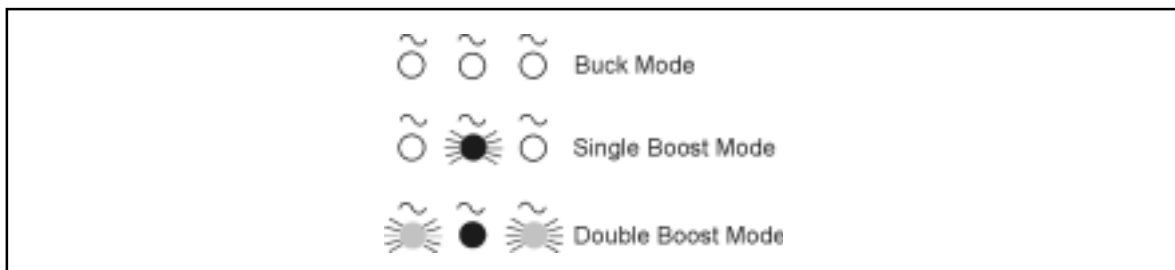




Figure 7. Buck and Double Boost Indicators

Battery Mode

When the UPS is operating during a power outage, the alarm beeps once every four seconds and the  indicator illuminates. When the utility power returns, the UPS switches to Normal mode operation while the battery recharges.

If battery capacity becomes low while in Battery mode, the  indicator flashes and the alarm beeps twice every two seconds. Immediately complete and save your work to prevent data loss and similar difficulties. When utility power is restored after the UPS shuts down, the UPS automatically restarts.

Sleep Mode

If the UPS is on battery for approximately five minutes and supporting a small electrical load ($\leq 10\%$), the UPS shuts down the load. After three minutes in Sleep mode, the UPS initiates a shutdown warning (two beeps every two seconds). This feature conserves battery power. To enable this feature, contact your service representative.


UPS Configuration

Your PW5125 UPS can be configured by using a configuration software that can be found on web (www.emea.powerware.com/product/PW5125.htm). This software is a DOS based program that can be executed from either a DOS box, from a Windows shortcut, or from the Windows Start, Run dialog box.

UPS setting that can be changed are as follow:

1. Voltage setting 220/230/240 V (230 V is factory default)
2. Enable/disable sleep mode (disable as factory default)
3. Enable/disable audible alarm, so that when disable no audible alarms will be given (Enable as factory default)
4. Enable/disable site wiring detection (not supported on European model)

Turning the UPS On



After the UPS is connected to a power outlet, it conducts a self-test and enters Standby mode. To turn on the UPS, press and hold the On button until you hear the UPS beep (approximately one second). The  indicator stops flashing and the bar graph indicators display the percentage of load being applied to the UPS.

Starting the UPS on Battery

NOTE Before using this feature, the UPS must have been powered by utility power at least once.

To turn on the UPS without using utility power, press and hold the On button for at least four seconds. The UPS supplies power to your equipment and goes into Battery mode.

Turning the UPS Off

To turn off the UPS, press and hold the Off  button until the long beep ceases (approximately five seconds). The  indicator begins to flash and the UPS remains in Standby mode until you unplug the UPS from the power outlet.

Initiating the Self-Test

NOTE. The batteries must be fully charged to perform the self-test.

Press and hold the On button for three seconds to initiate the self-test. During the test, individual indicators illuminate as various parts of the UPS are checked. If the alarm beeps or a UPS alarm indicator stays on, see Table 2 on page 22.

Communication Port

The Powerware 5125 is factory-installed with a Single-Port Module.

To establish communication between the UPS and a computer, connect your computer to the UPS communication port using the supplied communication cable.

When the communication cable is installed, power management software can exchange data with the UPS. The software polls the UPS for detailed information on the status of the power environment. If a power emergency occurs, the software initiates the saving of all data and an orderly shutdown of the equipment.

The cable pins are identified in Figure 8 and the pin functions are described in Table 1.

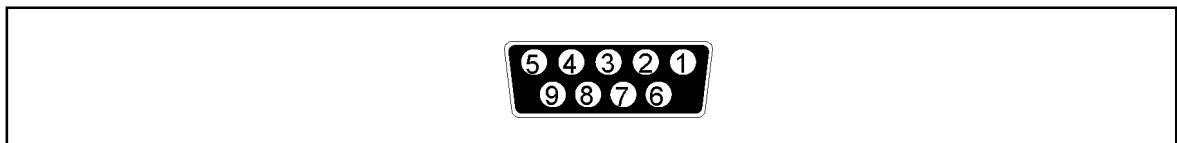


Figure 8. Communication Port

Pin Number	Signal Name	Function	Direction from the UPS
1	Low Batt	Low Battery relay contact	Out
2	RxD	Transmit to external device	Out
3	TxD	Receive from external device	In
4	DTR	PnP (Plug and Play) from external device (tied to Pin 6)	In
5	GND	Signal common (tied to chassis)	—
6	DSR	To external device (tied to Pin 4)	Out
7	RTS	PnP from external device	In / Out
8	AC Fail	AC Fail relay contact	Out
9	Power Source	+V (8 to 24 volts DC power)	Out

Table 1. Communication Port Pin Assignment

Network Transient Protector

The Network Transient Protector, shown in Figure 9, is located on the rear panel and has jacks labeled IN and OUT. This feature accommodates a single RJ-45 (10BaseT) network connector.

Connect the input connector of the equipment you are protecting to the jack labeled IN. Connect the output connector to the jack labeled OUT.

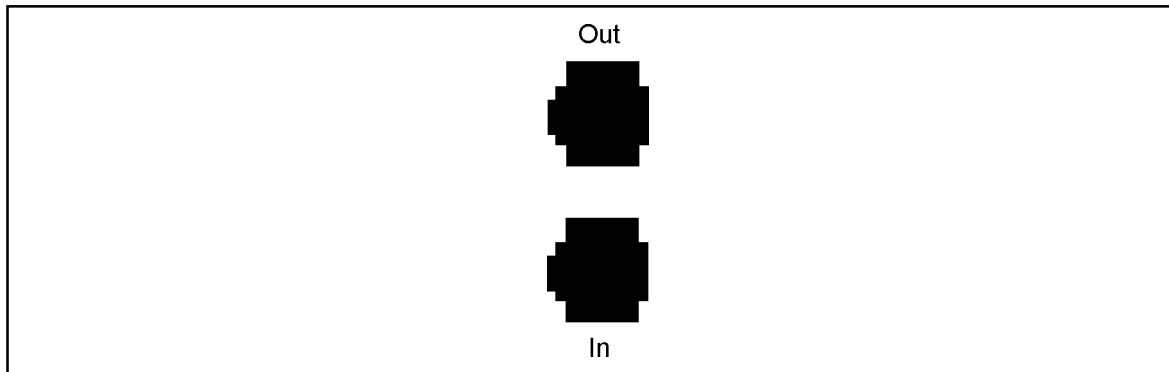


Figure 9. Network Transient Protector

Load Segments

Load segments are sets of receptacles that can be controlled by power management software, providing an orderly shutdown and startup of your equipment. For example, during a power outage, you can keep key pieces of equipment running while you turn off other equipment. This feature allows you to save battery power. See your power management software manual for details.

NOTE. If the power management software is not used, the individual load segments cannot be controlled.

The following figures show the load segments for each UPS.

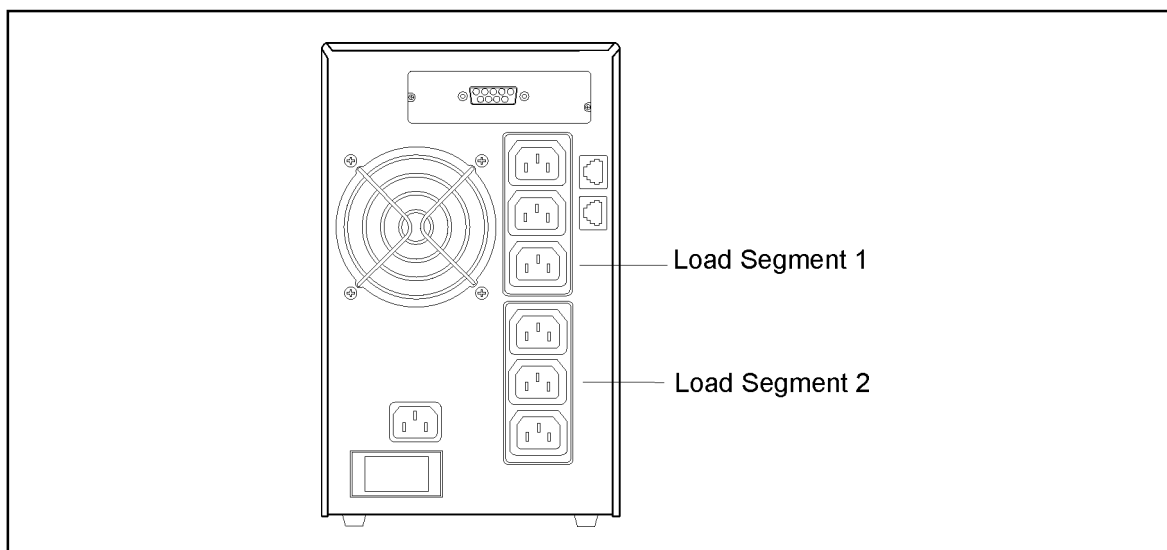


Figure 10. 1000 VA and 1500 VA Load Segments

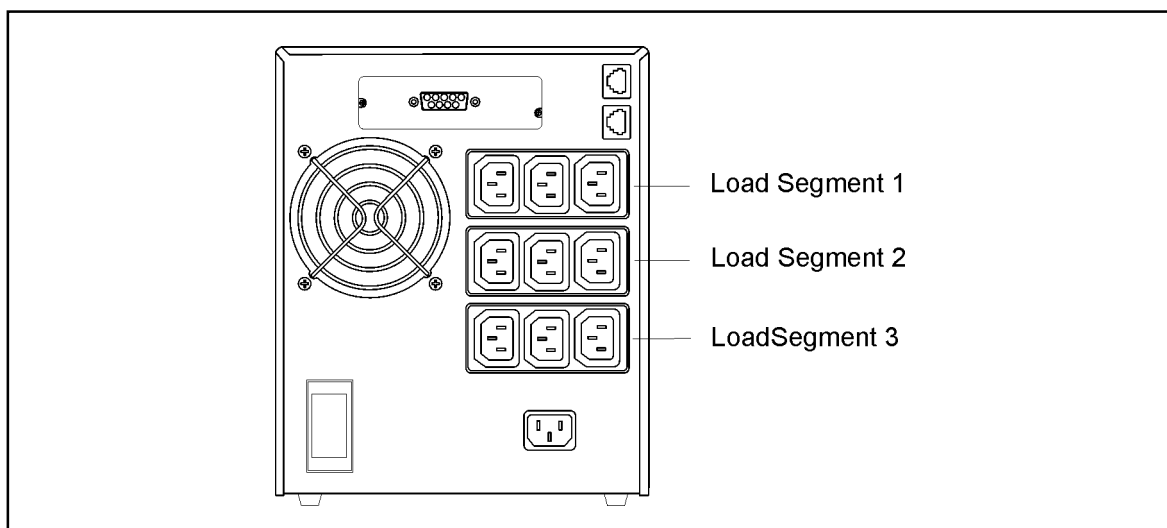


Figure 11. 2200 VA Load Segments

4 UPS Maintenance

UPS and Battery Care

For the best preventive maintenance, keep the area around the UPS clean and dust-free. If the atmosphere is very dusty, clean the outside of the system with a vacuum cleaner.




For full battery life, keep the UPS at an ambient temperature of 25°C .

Storing the UPS and Batteries

If you store the UPS for a long period, recharge the battery every 6 months by plugging the UPS into a power outlet. The batteries charge to 90% capacity in approximately 3 hours. However, it is recommended that the batteries charge for 24 hours after long-term storage.

Check the battery recharge date on the shipping carton label. If the date has expired and the batteries were never recharged, do not use the UPS. Contact your service representative.


When to Replace Batteries

When the  indicator flashes and there is a continuous audible alarm, the batteries may need replacing. Conduct a self-test by pressing and holding the  button for three seconds. If the  indicator stays on, contact your service representative to order new batteries.

Replacing Batteries

NOTE DO NOT DISCONNECT the batteries while the UPS is in Battery mode.

With the hot-swappable battery feature, UPS batteries can be replaced easily without turning the UPS off or disconnecting the load.

If you prefer to remove input power to change the battery: 1) Press and hold the Off  button until the long beep ceases (approximately five seconds), then unplug the UPS; 2) Wait 60 seconds while the internal processor shuts down before you disconnect the battery.

Consider all warnings, cautions, and notes before replacing batteries.



WARNING

Batteries can present a risk of electrical shock or burn from high short-circuit current. The following precautions should be observed: 1) Remove watches, rings, or other metal objects; 2) Use tools with insulated handles; 3) Do not lay tools or metal parts on top of batteries.

ELECTRIC ENERGY HAZARD. Do not attempt to alter any battery wiring or connectors. Attempting to alter wiring can cause injury.

How to Replace Extended Battery Modules

Use the following procedure to replace EBMs:

1. Unplug the EBM cable from the UPS.
2. Replace the EBM. See “Recycling the Used Battery” on page 20 for proper disposal.
3. Plug the new EBM into the UPS as shown in Figure 12.
4. For additional EBMs, plug the EBM cable of the second cabinet into the battery connector on the first EBM.

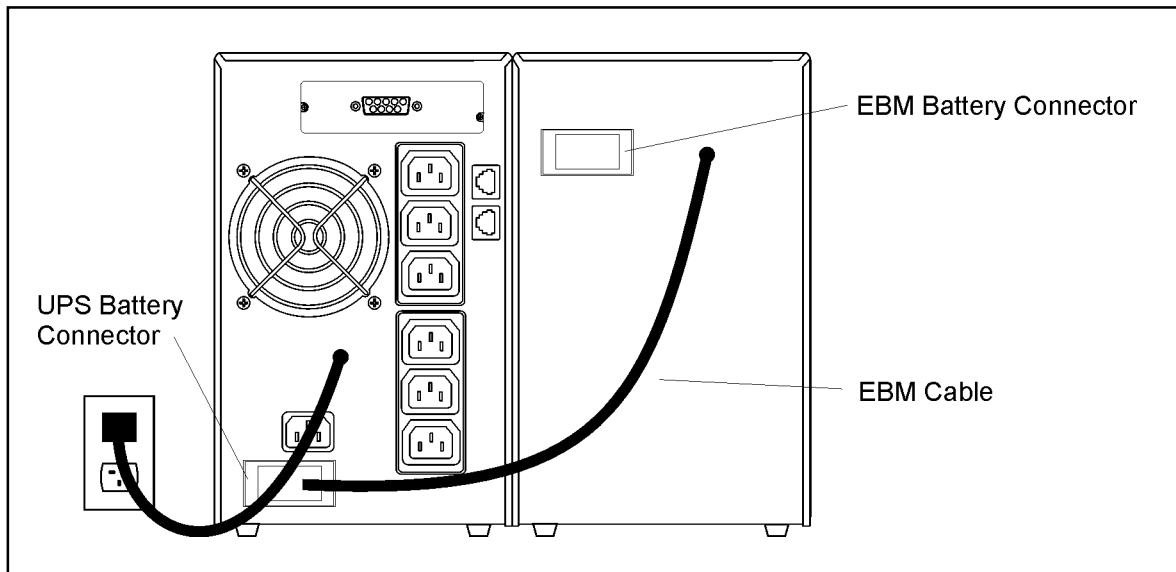


Figure 12. EBM Connections

How to Replace Internal Batteries

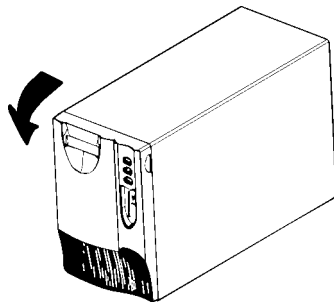


CAUTION

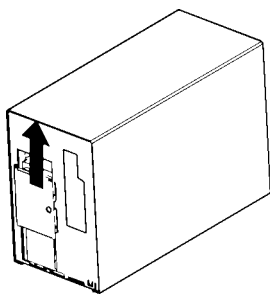
Pull the battery out onto a flat, stable surface. The battery is unsupported when you pull it out of the UPS.

Use the following procedure to replace internal batteries:

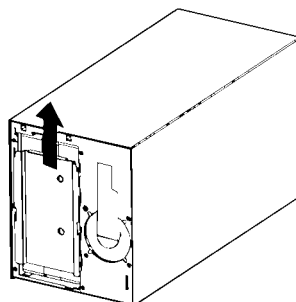
1. Remove the UPS front panel by pulling the top.



2. Slide up and remove the metal battery cover.

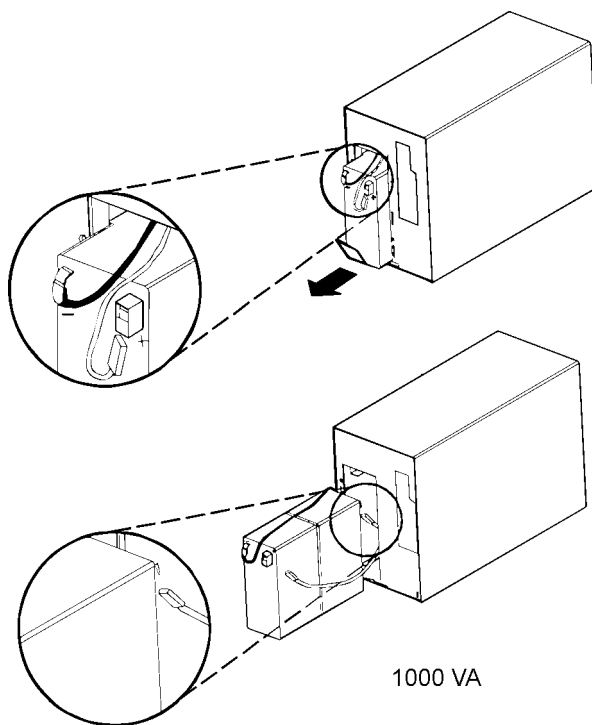


1000 VA



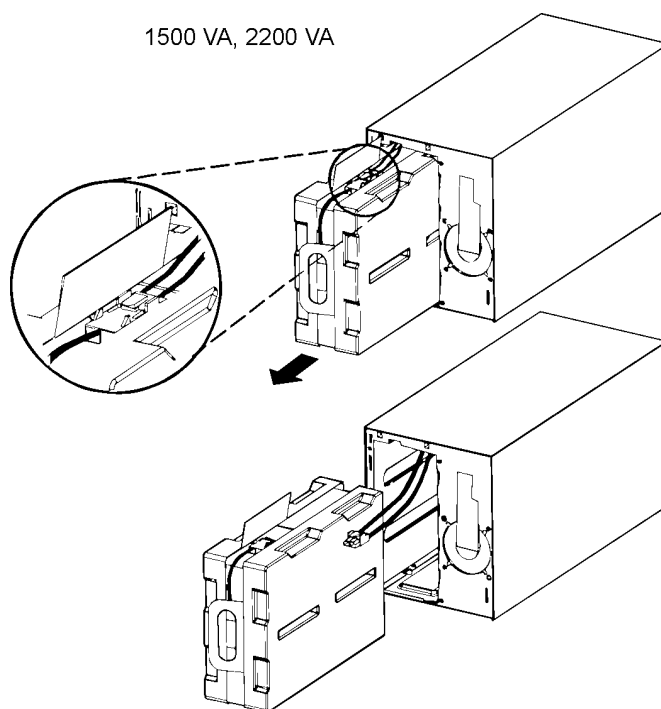
1500 VA, 2200 VA

3. 1000 VA units. Disconnect the red battery cable on the front of the battery. Pull the battery out onto a flat, stable surface. Disconnect the black battery cable on the rear of the battery, then on the front of the battery. Disconnect the red battery cable on the rear of the battery. See "Recycling the Used Battery" on page 20 for proper disposal.






1000 VA

4. 1500 and 2200 VA units. Pull the battery out onto a flat, stable surface. Press on the black tab on the battery cable connector to disconnect the battery. See “Recycling the Used Battery” on page 20 for proper disposal.



5. Install the new batteries in the reverse order of removal.
6. Reinstall the metal battery cover removed in Step 2. Replace the front panel.

Testing New Batteries

Press and hold the  button for three seconds to initiate a self-test. After the test is finished, the  indicator should turn off. If the  indicator stays on, check the battery connections. Call your service representative if the problem persists.

Recycling the Used Battery

Contact your local recycling or hazardous waste center for information on proper disposal of the used battery.



WARNING

Do not dispose of the battery or batteries in a fire. Batteries may explode. Proper disposal of batteries is required. Refer to your local codes for disposal requirements. Do not open or mutilate the battery or batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.



CAUTION

Do not discard the UPS or the UPS batteries in the trash. This product contains sealed, lead-acid batteries and must be disposed of properly. For more information, contact your local recycling or hazardous waste center.



5 Troubleshooting

Audible Alarms and UPS Conditions

The UPS has an audible alarm feature to alert you of potential power problems. Use Table 2 to determine and resolve the UPS alarms and conditions.

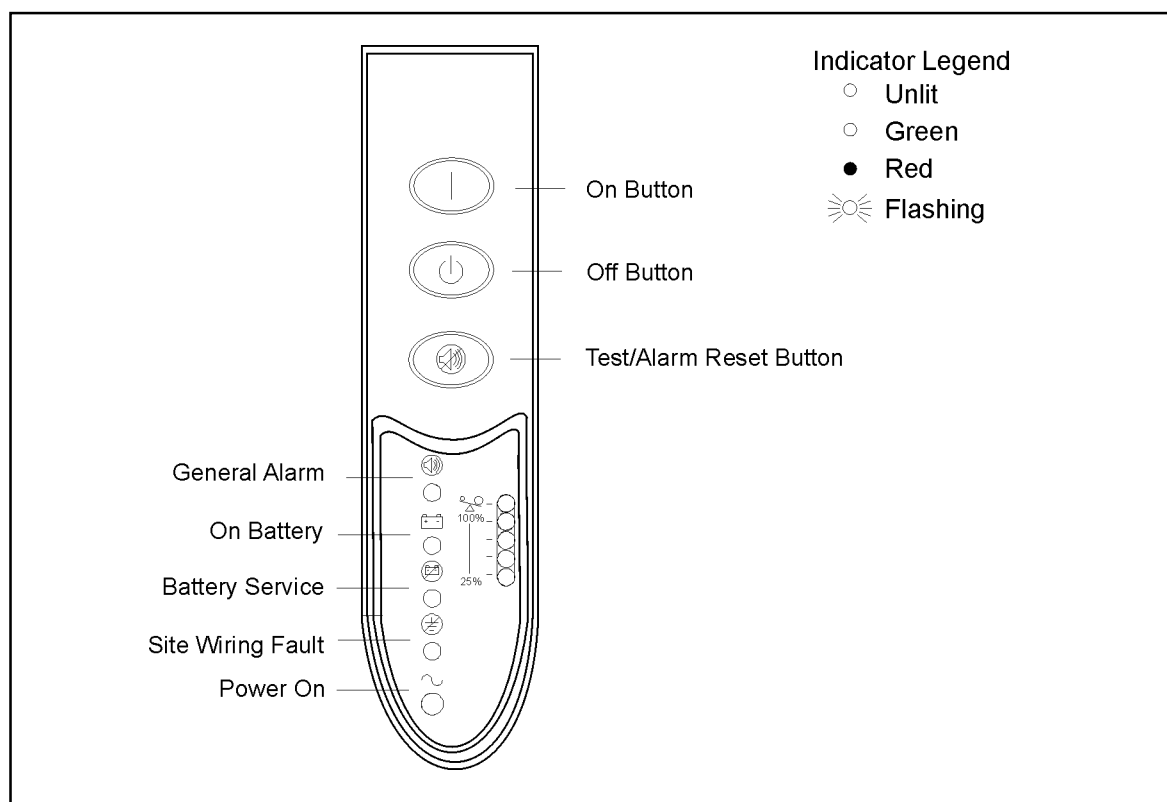



Figure 13. Alarm Indicators

Silencing an Audible Alarm

To silence the alarm for an existing fault, press the  button. If UPS status changes, the alarm beeps, overriding the previous alarm silencing. The alarm does not silence if there is a low battery condition.



























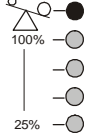










Alarm or Condition	Possible Cause	Action
The  indicator is not on; the UPS does not start.	The power cord is not connected correctly.	Check the power cord connections.
	The wall outlet is faulty.	Have a qualified electrician test and repair the outlet.
The  indicator is flashing; power is not available at the UPS output receptacles.	The UPS is in Standby mode.	Press the On  button to supply power to the connected equipment.
The UPS does not provide the expected backup time.	The batteries need charging or service.	Plug the UPS into a power outlet for 24 hours to charge the battery. After charging the battery, press and hold the  button for 3 seconds; then check the  indicator. If the  indicator is still on, see "UPS Maintenance" to replace the battery.
 	The self-test failed	Plug the UPS into a power outlet for at least 3 hours to charge the battery. After charging the battery, press and hold the  button for 3 seconds; then check the  indicator. If the  indicator is still on, shut down the UPS and contact your service representative.
	UPS internal temperature is too high.	The UPS shuts down automatically in 10 seconds. Turn off and unplug the UPS. Clear vents and remove any heat sources. Ensure the airflow around the UPS is not restricted. Wait at least 5 minutes and restart the UPS. If the condition persists, contact your service representative.
 1 beep every 4 seconds 	UPS on battery.	The UPS is powering the equipment with battery power. Prepare your equipment for shutdown.
 2 beeps every 2 seconds 	The battery is running low.	3 minutes or less of battery power remains (depending on load configuration and battery charge). Save your work and turn off your equipment. The alarm cannot be silenced.

Table 2. Troubleshooting Guide

Alarm or Condition	Possible Cause	Action
   	The UPS is running on battery power because the input voltage is too high or too low.	Correct the input voltage, if possible. The UPS continues to operate on battery until the conditions is corrected or the battery is completely discharged. If the condition persists, the input voltage in your area may differ from the UPS nominal.
	The utility line voltage and frequency are out of specification.	Have a qualified electrician check the wiring.
 1 beep every 5 seconds. 	The battery may be fully discharged.	Plug the UPS into a power outlet for 24 hours to charge the battery. After charging the battery, press and hold the  button for 3 seconds; then check the  indicator. If the  indicator is still on, see "UPS Maintenance" to replace the battery.
	The battery is not connected correctly.	Check the battery connections. Call your service representative if the problem persists.
 	Ground wire connection does not exist or the line and neutral wires are reversed in the wall outlet.	Have a qualified electrician correct the wiring.
 100% —●— —●— —●— 25% —●—	Power requirements exceed UPS capacity (101–110% for 3 minutes or 111–150% for 10 cycles) or the load is defective.	Turn off and unplug the UPS. Remove some of the equipment from the UPS. Wait at least 5 seconds until all LEDs are off and restart the UPS. You may need to obtain a larger capacity UPS.
         	UPS fault condition.	Save your work and turn off your equipment. Turn off and unplug the UPS. Contact your service representative. The alarm cannot be silenced.

6 Specifications

Model Number	Power Levels (rated at nominal inputs)	Nominal Voltage	Input Voltage Range
PW5125 1000i	1000 VA, 700 W	230 V	154-288 V (-30%/+20%)
PW5125 1500i	1500 VA, 1050 W	230 V	
PW5125 2200i	2200 VA, 1600 W	230 V	

Table 3. Model Specifications

	Dimensions (W x D x H)	Weight
1000 VA Models	162 x 401 x 250 mm	15 kg
1500 VA Models	162 x 467 x 250 mm	23 kg
PW5125 2200i	205 x 493 x 250 mm	31 kg
Extended Battery Module	162 x 474 x 250 mm	27 kg

Table 4. Weights and Dimensions

	Input Connection	Output Receptacles
PW5125 1000i	10 A, IEC-320 input connector	(6) 10 A, IEC 320-C13
PW5125 1500i	10 A, IEC-320 input connector	(6) 10 A, IEC 320-C13
PW5125 2200i	10 A, IEC-320 input connector	(9) 10 A, IEC 320-C13

Table 5. Power Connections

Operating Frequency	50/60 Hz, auto-sensing
Frequency Range	46–65 Hz
Noise Filtering	MOVs and line filter for normal and common mode noise
Regulation (Normal mode)	-10% to +6% of nominal voltage
Regulation (Battery mode)	Nominal output voltage $\pm 5\%$
Voltage Waveform	Sine wave

Table 6. Technical Specifications

Operating Temperature	10°C to 40°C Optimal battery performance: 25°C
Storage Temperature	0°C to 25°C
Transit Temperature	-25°C to 55°C
Relative Humidity	5–95% noncondensing
Operating Altitude	Up to 3,000 meters above sea level
Transit Altitude	Up to 15,000 meters above sea level
Audible Noise	Less than 40 dBA Normal mode, typical load Less than 55 dBA Battery mode
Surge Suppression	ANSI C62.41 Category B (formerly IEEE 587), IEC 61000-4-5
Safety Conformance	UL 1778, UL 497A (data line only); CAN/CSA C22.2, No. 107.1; EN 50091-1-1 and IEC 60950
Agency Markings	UL and cUL; CE, C-Tick, LGA/GS, DEMKO
EMC	EN 50091-2, FCC Part 15, ICES-003

Table 7. Environmental and Safety

Configuration	1000 VA: (2) 24V, 9 Ah internal batteries 1500 VA: (4) 48V, 7 Ah internal batteries 2200 VA: (4) 48V, 12 Ah internal batteries
EBM Configuration	PW5125 EBM-24: (8) 24V, 9 Ah batteries PW5125 EBM-48: (8) 48V, 9 Ah batteries
Type	Sealed, maintenance-free, valve-regulated, lead-acid
Charging	Internal battery: less than 3 hours to 90% usable capacity at nominal line voltage after full load discharge External battery: recharging at 80% load or less is recommended; no more than 16x discharge time to 90% usable capacity at nominal line voltage after full load discharge; an external battery charger is recommended for faster recharge times when using more than 2 EBMs.
Monitoring	Advanced monitoring for earlier failure detection and warning; auto detection of additional EBMs

Table 8. Battery

Model	Internal UPS Batteries	1 EBM	2 EBMs	3 EBMs	4 EBMs
1000 VA	5/14	45/60	95/170		
1500 VA	6/17	33/79	63/146	92/174	120/201
2200 VA	6/14	26/60	55/170	81/198	106/224
NOTE Battery times are approximate and vary depending on the load configuration and battery charge.					

Table 9. Battery Run Times (in Minutes at Full/Half Load)